

## Andrew Noble

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CONTACT INFORMATION	GNS Healthcare 196 Broadway Cambridge, MA 02139 USA	Voice: (607) 351-6341 Email: <a href="mailto:andrew.e.noble@gmail.com">andrew.e.noble@gmail.com</a> Website: <a href="http://andrewenoble.com">http://andrewenoble.com</a>
PROFILE	Data Scientist passionate about working in multidisciplinary teams to solve cutting-edge problems and drive innovation. Skilled at communicating technical results to diverse audiences.	
SKILLS	<b>Programming:</b> Python, C/C++, Qt, SQL, Linux, Distributed Computing, Mathematica. <b>Tools:</b> Scikit-learn, NLTK, Gensim, Matplotlib, Pandas, Numpy, Jupyter, Flask, D3.js, LaTeX. <b>Machine/Statistical Learning:</b> Logistic/Linear Regression, SVM, Neural Networks, K-Means, PCA, Hierarchical Bayes, NLP, Large-scale Monte Carlo Simulations, MLE, Bootstrap Resampling, Multivariate Stochastic Processes, Markov Chains, Undirected Graphical Models.	
EDUCATION	<b>Cornell University</b> , Ithaca, New York Ph.D., Physics, August 2008, Dissertation Topic: "Particle Physics and Cosmology at the Terascale" Advisor: Maxim Perelstein M.S., Physics, September 2006  <b>Johns Hopkins University</b> , Baltimore, Maryland M.A., Secondary Science Teaching, May 2002  <b>Carleton College</b> , Northfield, Minnesota B.A., Physics, Magna cum laude, Physics department honors, Phi Beta Kappa, June 2000	
PROFESSIONAL EXPERIENCE	<b>GNS Healthcare</b> , Cambridge, Massachusetts <i>Data Scientist</i>	2016 - present
	<b>Insight Data Science</b> , Boston, Massachusetts <i>Fellow</i>	2016
	<b>University of California</b> , Davis, California Department of Environmental Science and Policy <i>Project Scientist</i> with Alan Hastings <i>Postdoctoral Fellow</i> with Alan Hastings	2013 - 2016 2011 - 2013
	<b>University of Maryland</b> , College Park, Maryland Department of Biology <i>Postdoctoral Fellow</i> with William F. Fagan	2009 - 2010
	<b>University of Texas</b> , Austin, Texas Integrative Biology <i>Postdoctoral Fellow</i> with Timothy H. Keitt	2008 - 2009
GRANTS	<i>From Population Ecology to Physics and Back: Understanding Spatiotemporal Synchrony Using Ising-class Phase Transitions in Noisy Dissipative Models.</i> Supported by the NSF INSPIRE program with joint funding from the Directorates for Mathematical and Physical Sciences (MPS) and Biological Sciences (BIO). Co-PI with Alan Hastings (PI) and Jonathan Machta, \$600,000.	

## PUBLICATIONS

**Noble, A.E.**, T. S. Rosenstock, P. H. Brown, J. Machta, and A. Hastings. Spatial synchrony of pistachio production described by 2D Ising critical point. In preparation.

**Noble, A.E.**, S. Karimeddiny, A. Hastings, and J. Machta. Critical fluctuations of noisy period-doubling maps. Submitted.

**Noble, A.E.**, J. Machta, and A. Hastings. (2015) Emergent Long-range Synchronization of Oscillating Ecological Populations Without External Forcing Described by Ising Universality. *Nature Communications*. 6: 6664.

**Noble, A.E.**, W.F. Fagan. (2015) A Niche Remedy for the Dynamical Problems of Neutral Theory. *Theoretical Ecology*. 8: 149–161.

Fagan, W.F., Y.E. Pearson, E.A. Larsen, H.J. Lynch, J. Turner, H. Staver, **A.E. Noble**, S. Bewick, and E.E. Goldberg. (2013) Phylogenetic Prediction of the Maximum Per Capita Rate of Population Growth. *Proceedings of the Royal Society B* 280: 20130523.

Fagan, W.F., R.S. Cantrell, C. Cosner, T. Mueller, and **A.E. Noble**. (2012) Leadership, Social Learning, and the Maintenance (or Collapse) of Migratory Populations. *Theoretical Ecology* 5: 253–264.

**Noble, A.E.**, A. Hastings, and W.F. Fagan. (2011) A Multivariate Moran Process with Lotka-Volterra Phenomenology. *Physical Review Letters* 107: 228101.

**Noble, A.E.**, N.M. Temme, W.F. Fagan, and T.H. Keitt. (2011) A Sampling Theory for Asymmetric Communities. *Journal of Theoretical Biology* 273: 1–14.

**Noble, A.E.** and M. Perelstein. (2008) Higgs Self-Coupling as a Probe of Electroweak Phase Transition. *Physical Review D* 78: 063518. (authors listed alphabetically by convention)

Birkedal, A., **A.E. Noble**, M. Perelstein, and A. Spray. (2006) Little Higgs Dark Matter. *Physical Review D* 74: 035002. 150+ citations. (authors listed alphabetically by convention)

Hubisz, J., P. Meade, **A.E. Noble**, and M. Perelstein. (2006) Electroweak Precision Constraints on the Littlest Higgs Model with T Parity. *Journal of High Energy Physics* 0601: 135. 200+ citations. (authors listed alphabetically by convention)

**Noble, A. E.** (2000) What causes motion? A lesson plan on Newton’s Second Law. Purchased by the American Association for the Advancement of Science’s Project 2061 for use in their literature and workshops.

TEACHING  
EXPERIENCE

**University of Massachusetts**, Amherst, Massachusetts  
*Undergraduate research advisor*, Physics Department 2013 - present  
 Supervised Saba Karimeddiny on analytical and computational approaches to understanding emergent complexity in stochastic spatial population models.

**Cornell University**, Ithaca, New York  
*Teaching Assistant*, Particle Physics Spring 2008  
 Delivered five lectures during the semester. Created a problem set covering details of the Standard Model and Higgs physics.

*Co-advisor*, Physics NSF-REU program Summer 2007  
 Supervised Zach Lamberty, a rising senior at Notre Dame, in simulating particle interactions on a lattice of coupled oscillators and the evolution of domain walls in the early universe.

*Teaching Assistant*, Physics of Music Spring 2007  
 Held primary responsibility for the intensive writing component of a Writing in the Majors course. A student term paper won the 2007 Knight Prize for Writing in the Majors.

*Teaching Assistant*, Modern Experimental Optics Fall 2006  
 Worked closely with the ten students enrolled in this advanced lab course, often with sole responsibility for lab instruction.

*Teaching Assistant*, Various introductory courses 2002 - 2005  
 In Electricity, Magnetism and Thermal Physics (Fall 2002, Spring 2003, Fall 2003), and Fundamentals of Physics I (Spring 2005) and II (Fall 2005), each TA is responsible for leading biweekly recitation sections and weekly lab instruction. Each section contains approximately twenty students. I prepared my own lesson plans for each recitation section. Emphasis was placed on team problem-solving and inquiry-based mini-labs.

**Southwestern High School**, Baltimore, Maryland  
*Physics teacher and Teach for America corps member* 2000 - 2002  
 Obtained full certification as a secondary science teacher. Named teacher of the month in January 2001 for guiding technology students in the construction of a school website. Founded a mentorship program in collaboration with the physics department of Johns Hopkins University, including the department chair, Professor Richard Henry. Led a team of students to a second place finish in a field of twenty-seven city and county schools at a robotics competition organized by IEEE.

CONFERENCE  
 PRESENTATIONS

Noble, A. E., Machta, J., and Hastings, A.  
 “Critical Fluctuations Near the Pitchfork Bifurcations of Period-doubling Maps”  
 March Meeting of the American Physical Society, San Antonio, Texas March 2015

Noble, A. E., Machta, J., and Hastings, A.  
 “Ising-like Patterns of Spatial Synchrony in Population Biology”  
 March Meeting of the American Physical Society, Denever, Colorado March 2014

Noble, A. E. and Hastings, A.  
 “An Ising-like, Continuous Phase Transition in a Population Biology Model”  
 Everything Disperses to Miami, Miami, Florida December 2012

Noble, A. E. and Hastings, A.  
 “Resilience and Vulnerability in Large Nonlinear Food Webs”  
 Ecological Society of America Annual Meeting, Austin, Texas August 2011

Noble, A. E. and Temme, N. M.  
 “Asymptotic Expansions of Hypergeometric Functions  
 Enable the Mechanistic Modeling of Large Ecological Communities”  
 Special Functions in the Twenty-First Century, Washington, DC April 2011

Noble, A. E. and Fagan, W. F.  
 “A Unification of Niche and Neutral Theories for Zero-sum Communities”  
 Annual Meeting of the Society for Mathematical Biology, Rio de Janeiro, Brazil July 2010

	Noble, A. E. and Perelstein, M. “Higgs Self-Coupling as a Probe of the Electroweak Phase Transition” Cornell-Syracuse Theory Meeting, Syracuse University	December 2008
	Noble, A. E. and Perelstein, M. “The Higgs Cubic and The Viability of Electroweak Baryogenesis” Particles, Strings, and Cosmology, Perimeter Institute, Canada	June 2008
	Noble, A. E., Hubisz, J., and Perelstein, M. “The Littlest Higgs with T Parity Enters Madgraph 4.0” Monte Carlo Tools for Beyond the Standard Model, Princeton University	March 2007
	Noble, A. E., Birkedal, A., Spray, A., and Perelstein, M. “Little Higgs Dark Matter” Vancouver Linear Collider Workshop, University of British Columbia at Vancouver	July 2006
	Noble, A. E., Birkedal, A., Spray, A., and Perelstein, M. “Little Higgs Dark Matter” Phenomenology, University of Wisconsin at Madison	May 2006
	Noble, A. E., Hubisz, J., Meade, P., and Perelstein, M. “Electroweak Precision Constraints on the Littlest Higgs Model with T Parity” Cornell-Syracuse Theory Meeting, Syracuse University	December 2005
INVITED SEMINARS	“Ising universality describes emergent long-range synchronization of coupled ecological oscillators” March Meeting of the American Physical Society, New Orleans, Louisiana	March 2017
	“Ising universality describes emergent long-range synchronization of coupled ecological oscillators” Princeton Biophysics Journal Club, Princeton University	May 2016
	“Spontaneous Emergence of Spatial Synchrony in Ecological Populations” Department of Ecology, Evolution, and Natural Resources, Rutgers University	April 2016
	“Spontaneous Emergence of Spatial Synchrony in Ecological Populations” Department of Ecology and Evolution, Stony Brook University	April 2016
	“Ising Universality Describes Emergent Synchronization” Sommerfeld Center for Theoretical Physics, University of Munich	December 2015
	“Critical Transitions in Ecological Populations: Applying Physics and Mathematics to Obtain Robust Predictions in Biology” Four College Biomath Consortium, Amherst College	October 2015
	“Of Beetles and Magnets: Merging Metapopulation Biology and Statistical Physics” Department of Biology, Humboldt State University	September 2011
	“Reconciling Niche and Neutral Theories in Community Ecology” Center for Ecology and Evolutionary Biology, University of Oregon	May 2011
	“A Unification of Niche and Neutral Theories for Competitive Ecological Communities” Department of Mathematics, Humboldt State University	April 2011

	“A Non-neutral Theory of Dispersal-limited Community Dynamics” Ecology and Evolutionary Biology Department, University of Michigan	March 2011
	“Theoretical Perspectives on Community Ecology” Department of Biology, Georgetown University	November 2010
	“The Higgs Cubic and The Viability of Electroweak Baryogenesis” Theoretical Particle Physics Group Seminar, Cornell University	May 2008
	“The Littlest Higgs with T Parity” Korean Institute for Advanced Study, Seoul, Korea	July 2007
	“Electroweak Precision Constraints on the Littlest Higgs Model with T Parity” Theoretical Particle Physics Group Seminar, Cornell University	September 2005
INVITED SEMINARS FOR UNDERGRADUATES	“Symmetry and Modern Physics: The Enduring Legacy of Noethers Theorem” Department of Physics, Mount Holyoke College	April 2016
	“When pistachio orchards behave like magnets: The Ising model and collective synchronization in population dynamics” Department of Physics, Mount Holyoke College	November 2015
	“When ecological populations behave like magnets: The universality of critical transitions in synchronization” Department of Mathematics and Statistics, Williams College	September 2015
	“The Interface of Physics and Ecology: Collective Synchronization of Oscillations” Department of Physics, University of Massachusetts, Amherst	April 7, 2014
	“Research at the Interface of Physics and Ecology” Department of Physics and Astronomy, Carleton College	April 2011
	“Theoretical Perspectives” Research Experience for Undergraduates Seminar Series, Cornell University	June 2008
	“Looking into Atoms” Department of Physics and Astronomy, Carleton College	October 2005
CO-ORGANIZED WORKSHOPS	Origins of Large-scale Spatial Synchrony in Ecology and Epidemiology II, Co-organized with Jonathan Machta and Alan Hastings, Santa Fe Institute	June 2016
	Origins of Large-scale Spatial Synchrony in Ecology and Epidemiology, Co-organized with Jonathan Machta and Alan Hastings, Santa Fe Institute	May 2015
PROFESSIONAL WORKSHOPS AND SCHOOLS	Uncertainty, Sensitivity, and Predictability in Ecology, Mathematical Biosciences Institute, Ohio State University	October 2015
	The Tony and Pat Houghton Conference on Non-Equilibrium Statistical Mechanics, Institute for Computational and Experimental Research in Mathematics, Brown University	May 2015
	Workshop on Animal Movement, Smithsonian Conservation Biology Institute	January 2012

Workshop on Intraspecific Variation, Burnet, Texas	August 2011
Workshop on Synchronous Activity in Biological Systems, National Institute for Mathematical and Biological Synthesis	April 2011
Complex Systems Summer School, Santa Fe Institute	June 2009
Theoretical Advanced Study Institute, University of Colorado at Boulder	June 2006
Princeton Institute for Theoretical Physics, Institute for Advanced Study	July 2005.
Workshop on Standardized Test Questions, Project 2061, AAAS	December 2000

PROFESSIONAL  
MEMBERSHIPS

American Physical Society, Ecological Society of America, and Society for Mathematical Biology.

REFEREE  
ACTIVITIES

*Bioinformatics, Differential Equations and Dynamical Systems, Discrete and Continuous Dynamical Systems B, Ecology, Ecology Letters, Journal of Biological Dynamics, Maryland Sea Grant Research, Nature Scientific Reports, Oikos, Phys Rev Letters, Phys Rev E, PLOS ONE, Theoretical Ecology.*

COMMUNITY  
SERVICE

Board Member, Cushman Scott Children's Center, Amherst, Massachusetts, 2013 to present.

Co-director of physics outreach at the Lansing juvenile detention facility for women from 2004 to 2006, and co-recipient of a 2005 Robinson-Appel Humanitarian Award supporting our science club.